

REMARKS

Please reconsider the application in view of the above amendments and the following remarks. Applicants thank the Examiner for carefully considering this application and for accepting the drawings submitted on November 14, 2003, as formal.

Disposition of Claims

Claims 1-16 are pending in the present patent application. Claims 1 and 10 are independent. The remaining claims depend, either directly or indirectly, from claims 1 and 10.

Claim Amendments

Claims 1 and 10 have been amended to clarify the use of the program counter. Claim 10 is further amended to clarify the scope of the invention. Claims 11-16 are amended to conform to the amendments to claim 10. Support for the above amendment may be found, for example, in Figure 3 and paragraphs [0023]-[0026] of the referenced application. No new matter has been added by any of the aforementioned amendments.

Double Patenting Rejection

Claims 1-16 are provisionally rejected on the ground of nonstatutory obviousness type double patenting as being unpatentable over claims 1-20 of co-pending U.S. Patent Application No. 10/713,411. A terminal disclaimer in compliance with 37 CFR § 1.321(c) is filed with this response based on common ownership of the co-pending application and the instant application. Accordingly, withdrawal of this rejection is respectfully requested.

Rejection(s) under 35 U.S.C. § 101

Claims 10-16 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. More specifically, the Examiner rejected claims 10-16 as reciting elements that fail to tangibly embody the system and, thus, are software per se. To the extent the rejection may apply to amended claims 10-16, the rejection is traversed.

Claim 10, as amended, recites, in part, “[a] computer processor for tracing an instrumented program.” The recited computer processor is clearly not a program or software per se.

For at least these reasons, claim 10 complies with the statutory subject matter requirement of 35 U.S.C. §101. Claims 11-16 depend either directly or indirectly from claim 10 and, thus, also comply with the statutory subject matter requirement of 35 U.S.C. §101 for at least the same reasons as claim 10. Accordingly, withdrawal of this rejection is requested.

Rejections under 35 U.S.C. § 102

Claims 1-16 stand rejected under 35 U.S.C. § 102 as being anticipated by the article entitled “Trace Driven Memory Simulation: A Survey”, ACM, 6-1997 (“Uhlig”). To the extent that this rejection may still apply to the amended and original claims, the rejection is respectfully traversed.

“A claim is anticipated only if *each and every element* as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987) (emphasis added). Further, “[t]he identical invention must be shown in as complete detail as is contained in the claim.” *Richardson v.*

Suzuki Motor Co., 868 F.2d 1226, 1236 (Fed. Cir. 1989). The Applicants respectfully assert that Uhlig does not expressly or inherently describe each and every element of independent claim 1.

1. Uhlig fails to disclose a scratch space that both (a) includes an original instruction associated with a probe and (b) is referenced by a program counter

Amended independent claim 1 is directed to a method for tracing an instrumented program. More specifically, amended independent claim 1 recites, in part, obtaining an original instruction *associated with a probe*, loading an original instruction into a scratch space, and setting a program counter to *point to the scratch space*. The Examiner asserts that Uhlig teaches loading an original instruction associated with a probe into a scratch space and setting a program counter to point to the scratch space. *See* Office Action mailed February 8, 2007, p. 4. Specifically, the Examiner asserts that “addr” is equivalent to a scratch space. *See* Office Action mailed February 8, 2007, p. 4. However, the Examiner also asserts that “Translation Table/Cache” is equivalent to a scratch space. *See* Office Action mailed February 8, 2007, p. 4. The Applicants respectfully disagree.

With respect to the “addr”, Uhlig only discloses that the “addr” refers to the address of the current instruction. *See* Uhlig, pg. 138. However, Uhlig fails to disclose that the “addr” is loaded with an original instruction associated with a probe. Rather, the current instruction of Uhlig only describes an instruction that is currently executing. *See* Uhlig, pg. 138. Thus, the “addr” of Uhlig cannot be equivalent to a scratch space that is loaded with an original instruction associated with a probe. With respect to the “Translation Table/Cache”, Uhlig only discloses that the “Translation Table/Cache” is a lookup table including compiled sequences of native code. *See* Uhlig, pg. 140. However, Uhlig fails to disclose a program counter set to point to the “Translation Table/Cache.”

Thus, the “Translation Table/Cache” of Uhlig cannot be equivalent to a scratch space that is referenced by a program counter.

Thus, both “addr” and “Transition Table/Cache” fail to disclose a scratch space that (a) includes an original instruction associated with a probe *and* (b) is referenced by a program counter. In view of this, it is clear that these distinct elements, “addr” and “Translation Table/Cache,” of Uhlig are not equivalent to a scratch space as recited in amended independent claim 1.

2. Uhlig fails to disclose a program counter as is recited in amended independent claim 1

Amended independent claim 1 is directed to a method and apparatus for tracing an instrumented program using a thread. More specifically, claim 1 recites, in part, setting a *program counter* to point to a scratch space. The Examiner has asserted that Uhlig teaches setting a program counter to point to a scratch space. *See* Office Action mailed February 8, 2007, p. 4. The Applicant respectfully disagrees. Specifically, the Examiner has asserted that “trace[i++]” is equivalent to a “program counter.” *See* Office Action mailed February 8, 2007, p. 4. By asserting that “trace[i++]” is equivalent to a “program counter”, the Examiner is completely misconstruing the broadest ordinary meaning of the term “program counter.” One skilled in the art would appreciate that a program counter is a *register* in a *computer processor* indicating the current instruction being executed. In view of the above, a “program counter” cannot be construed to be equivalent to “trace[i++]”, as “trace[i++]” is an element of a trace *buffer* existing in *main memory*. *See* Uhlig, pg. 137. Said another way, “trace[i++]” refers to a data structure in *main memory* storing *all instructions* that have been executed. In view of this, it is clear that “trace[i++]” as described in Uhlig is not equivalent to a program counter as recited in amended independent claim 1.

Assuming *arguendo* that “trace[i++]” is equivalent to a program counter, Uhlig does not disclose setting a program counter to point to both a trap instruction and a scratch space as is recited in amended independent claim 1. Claim 1 recites, in part, “executing a trap instruction to transfer control of the instrumented program to a trap handler, wherein a program counter points to the *trap instruction*” and “setting the program counter to point to the *scratch space*.” Rather, Uhlig only discloses that “addr”, the address of the current instruction, is stored in “trace[i++]”. See Uhlig, pg. 139. As discussed above, “trace[i++]” refers to an iterative reference of each node in a trace buffer. In other words, Uhlig only discloses that an address for a single instruction is stored in each “trace[i++].” In view of this, it is clear that each “trace[i++]” pointing to the address of a single instruction of Uhlig is not equivalent to a program counter that points to a trap instruction *or* a scratch space as recited in amended independent claim 1.

In view of the above, Uhlig fails to disclose all the limitations of independent claim 1. In addition, amended independent claim 10 includes at least the same patentable subject matter as amended claim 1 and, thus, is patentable as well. Dependent claims 2-9 and 11-16 are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

3. Tamches fails to disclose setting a program counter to point to a scratch space

Claims 1-16 stand rejected under 35 U.S.C. § 102 as being anticipated by Tamches, “Fine-Grained Dynamic Instrumentation of Commodity Operating System Kernels”, University of Wisconsin, 2001 (“Tamches”). To the extent that this rejection may still apply to the amended and original claims, the rejection is respectfully traversed.

Amended independent claim 1 is directed to a method for tracing an instrumented program. More specifically, the method comprises, in part, setting a *program counter to point* to a scratch space. The Examiner asserts that Tamches teaches setting a program counter to point to a scratch space. See Office Action mailed February 8, 2007, p. 7. In contrast, Tamches only discloses *overwriting* an instruction at the *instrumentation point* with a jump instruction. See Tamches Figure 4.1 and p. 49. Further, Tamches only discloses that the program counter is *copied* (“written to %o7”) before performing a jump or a call operation. See Tamches, p. 52. In other words, Tamches only discloses the use of a *jump instruction* at the *instrumentation point* to reach the code patch. However, Tamches fails to disclose setting a *program counter to point* to a scratch space. In view of this, it is clear that overwriting an instruction with a *jump instruction* at the *instrumentation point* of Tamches is not equivalent to setting a *program counter to point* to a scratch space as recited in amended independent claim 1.

In view of the above, Tamches fails to disclose all the limitations of independent claim 1. In addition, amended independent claim 10 includes at least the same patentable subject matter as amended claim 1 and, thus, is patentable as well. Dependent claims 2-9 and 11-16 are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

Applicants believe this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below.


Application No.: 10/713,409

Docket No.: 03226/347001; SUN040249

Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 03226/347001).

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Respectfully submitted,

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Attachment (Terminal Disclaimer)